was confirmed on postoperative surveillance. These data demonstrate that effective and durable aneurysm exclusion is the rule, not the exception, even in the presence of challenging neck anatomy.

*Neck and aneurysm characteristics*

| | *Mean* | *Range* | *Incidence* |
|---|---|---|---|
| Neck diameter | 23.1 mm | 16.2 - 41.3 mm | N/A |
| Neck length | 15.7 mm | 1.5 - 21 mm | N/A |
| Neck Calcification | N/A | N/A | 48% |
| Neck Thrombus | N/A | N/A | 26% |
| Suprarenal angle | 18.5° | 3 - 41° | N/A |
| Infrarenal angle | 32.5° | 6 - 85° | N/A |
| Reverse cone | N/A | N/A | 33% |
| Max AAA diameter | 53 mm | 23 - 100 mm | N/A |

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**PP70.**

**Midterm Results of the Powerlink Suprarenal Bifurcated Device Pivotal Trial**

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**Objective:** We assessed the results of abdominal aortic aneurysm (AAA) repair with the Powerlink suprarenal bifurcated endovascular stent graft compared with open repair.

**Methods:** Beginning in October 2001, a prospective, controlled multicenter trial of the Powerlink suprarenal system for endovascular aneurysm repair was conducted at 17 sites in a pivotal US Food and Drug Administration trial. Supported by a Bayesian predictive probability analysis, test patient enrollment was discontinued early in November 2007 (N=153). Open AAA control patients were enrolled in the Powerlink infrarenal trial. Stent grafts were oversized by 10% to 20% relative to computed tomography scan (CT)-based measurements. All repairs were performed through one surgically exposed femoral artery and contralateral 9Fr percutaneous access. Post-operatively, results were assessed with contrast-enhanced CT scans and abdominal x-rays at 1, 6, and 12 months, and annually to five years.

**Results:** Technical success was achieved in 98.7% of patients, with two intraoperative conversions. Clinical utility measures were significantly reduced in the Powerlink group compared to the control group ($p<0.0001$) in terms of blood loss, procedure time, and intensive care unit and hospital lengths of stay. Within 30 days, fewer Powerlink than control patients died (1.3% vs. 6.1%, $p=0.06$) or experienced a major adverse event (MAE, 5.2% vs. 23%, $p=0.0004$). This trend is observed for cumulative events within one year (mortality: 7.2% vs. 14%, $p=0.208$; MAE: 20% vs. 30%, $p=0.037$). In the longer term, MAE-free survival was similar between groups ($p=0.731$). At the one-month CT scan, the core lab reported endoleak in 56 patients, of which 47 had a Type II endoleak. Through longer-term follow-up (mean 22 months), Type II endoleak predominated, with no Type III or IV endoleak. Secondary procedures were performed in 23 patients (15%) for treatment of endoleak (n=18), limb obstruction (n=3), and other causes (n=3). No ruptures or device material failure has occurred. A progressive reduction in mean aneurysm sac diameter is observed in follow-up.

**Conclusion:** The Powerlink suprarenal system appears safe and effectively protects patients from AAA rupture over the intermediate term. Continued careful follow-up is needed to ensure the durability of these results.

**Author Disclosures: Author Disclosures: J.P. Carpenter,** Endologix.

## Thoracic Aortic Disease

**PP71.**

**A Reappraisal of Extent IV Thoracoabdominal Aortic Aneurysms**

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**Objective:** Extent IV aneurysms have long been viewed as low risk members of the thoracoabdominal aortic aneurysm (TAAA) family. This perception is based largely on old data in which extent I and II aneurysms carried extremely high morbidity (paraplegia / paraparesis) and mortality risk relative to extent IV aneurysms. More recently, we have shown that preoperative renal function as measured by glomerular filtration rate (GFR) is worse with more extensive abdominal / visceral aortic involvement. Here we revisit the risk factors and outcomes of open repair of extent IV TAAA.

**Methods:** Between February 1991 and July 2008, we repaired 231 Crawford extent IV TAAA. Median age of the population was 70 (range 37-86) and 77/231 (33%) patients were female. All repairs were performed using open technique with graft replacement using distal aortic perfusion and cerebrospinal fluid drainage.

**Results:** Median baseline GFR was 59.6 (interquartile range 42-80) ml/min/1.73m2. When GFR is below the median, 30-day mortality is 30/111 (27%) vs 10/120 (8%), odds ratio 4.1, $p<0.0002$. Three immediate neurologic deficits occurred in the population (3/231 = 1%), and all of these were in the lowest quartile of GFR (GFR < 42).

**Conclusions:** Mortality following extent IV TAAA repair is strongly correlated with preoperative GFR. Neurologic deficit rates are very low in this population (1%) and in our experience occur exclusively in the setting of very low GFR. Risk stratification based on preoperative GFR is helpful in evaluating the outcome of different treatment modalities for patients with extent IV TAAA.

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**PP72.**

**Respiratory Morbidity Following Thoracoabdominal Aortic Repair**

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**Background:** Respiratory morbidity is significant following thoracoabdominal aortic aneurysm repair, with a substantial number of patients requiring mechanical ventilation for more than 3 days postoperatively. Though frequently reversible, difficulty weaning increases complexity of hospitalization and mortality. We reviewed our experience with 1443 patients undergoing descending thoracic or thoracoabdominal aortic repair.

**Methods:** Between February 1991 and July 2008, we performed 1443 descending thoracic or thoracoabdominal aortic repairs. Median patient age was 68 (interquartile range 58-74) and 539 (37%) were female. Preoperative and intraoperative factors were evaluated using multiple logistic regression analysis.

**Results:** 432/1443 (30%) patients required mechanical ventilation of greater than 72 hours' duration. Significant, independent preoperative risk factors were FEV1 <80% of predicted, decreasing glomerular filtration rate (GFR), emergency presentation, rupture and chronic obstructive pulmonary disease (COPD). Increasing aortic crossclamp time was the only intraoperative risk factor. Mortality among patients with prolonged ventilation was 135/432 (31%) vs. 102/999 (10%) without. For patients with normal GFR and FEV1, mortality is 2.4 percent ($p<0.0004$).

**Conclusion:** Ventilatory failure following thoracoabdominal aortic surgery occurs predominantly among the high-risk; specifically those with poor preoperative pulmonary and renal function and with rupture and emergent presentation. Long crossclamp times are also contributory. Mortality is significant in these patients.

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**PP73.**

**Open Repair of Descending Thoracic and Throacoabdominal Aortic Aneurysms: Contemporary Results**

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**Objective:** Descending thoracic and thoracoabdominal aortic aneurysms are complex, life threatening problems that present significant management challenges. As the range of treatment options grows, so too does the obligation of surgeons to understand and consider risk factors and how these might affect treatment. We reviewed our experience with open descending thoracic and thoracoabdominal aortic repairs to identify risk factors for neurologic deficit and mortality in contemporary practice.

**Methods:** Between February 1991 and July 2008, we performed 1443 descending thoracic or thoracoabdominal aortic operations. Median patient